III

SITE ANALYSIS

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Context and Site Description

Needham, located primarily on the west side of Route 128 / I95, is bounded on the northeast and south by the Charles River (Newton, Dedham and Dover lie across the river) and Wellesley along its northwest border.

Local Context

The site, 463 Charles River Street, is located on the Ridge Hill Reservation, which lies in the southeast quadrant of the Town, approximately 3 miles from Town Hall in Needham Center. The Reservation consists of approximately 222 acres of Conservation Commission controlled land. An area (Transfer Area) — mutually agreeable to the Conservation Commission and the Town — that includes the development of the senior center and associated parking will be transferred from the Conservation Commission to the Town via a legislature Home Rule Petition vote.

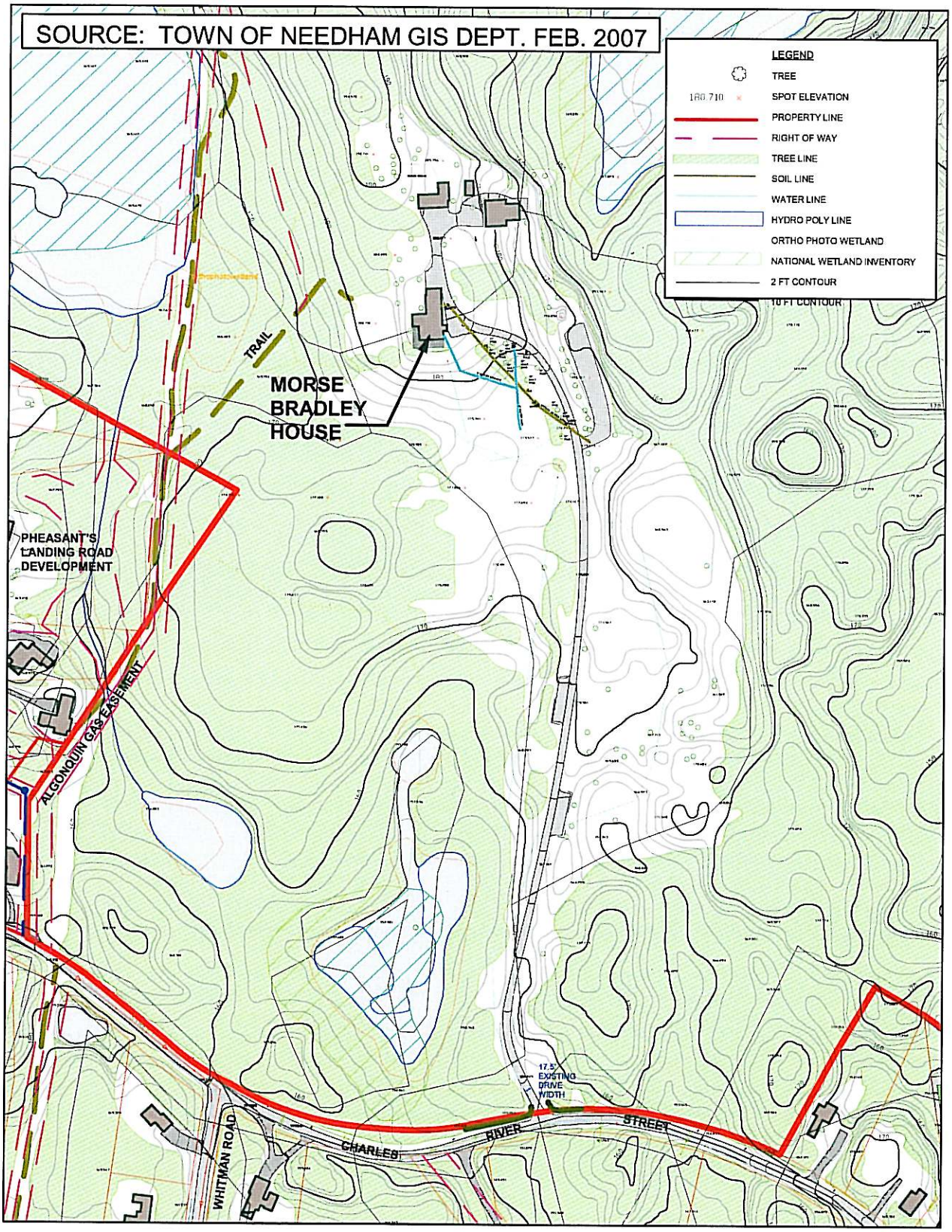
Historic Significance

The historic significance of the site is primarily social. The land was part of the 800 acre estate known as Ridge Hill Farms, and was the site of a summer amusement park in the mid-19th century. In 1890 the estate was split up and sold.

The main house, tan stucco with deep overhanging eaves, was built in 1906 by John Torrey Morse III during a time when wealthy Bostonians were establishing Needham as a summer escape. Gardner Bradley purchased the house in 1929. In 1972, after Bradley died, his grandson sold the estate to the Town of Needham, who purchased the 222 acres with federal and state funding for passive recreation.

The Morse-Bradley house is the only Town-owned reminder of the days when Needham was a summer haven for the wealthy and privileged.

Figure 3.1
Aerial view of Morse-Bradley House and outbuildings showing the upper meadows and tree canopy.



NEEDHAM SENIOR CENTER STUDY
Ridge Hill Reservation Existing Site Plan - Local Context

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Figure 3.2 RidgeHill Reservation Existing Site Plan - Local Context

Much of the following information is from the Town's GIS map of the area. During site visits it was noted that some elements are incorrectly located (e.g. hydrant along access road) or missing (e.g. lamp post at gravel lot). Until a full survey of the site is completed, there may be discrepancies.

Physical Features

Geology / Hydrology

Soils & Drainage

It is reported that the soils do not percolate well and that drainage is poor at the top of the site. The soil type changes to a more sandy soil where the main house seepage pits and barn leaching field are located,just north of the entry to the gravel lot. See Appendix B for 2001 percolation results.

It is recommended that additional soils testing be conducted, including borings for structural considerations and percolation tests for storm water management.

Wetlands

While not documented on the Town's GIS mapping, there appear to be two areas near the proposed development that may be wetlands. This should be confirmed with a survey of the site that includes wetlands demarcation.

Topography

The site rises about 30' from Charles River Street (@ +/- 156') to around the house where it levels out (@ +/- 186'), and then continues up another 8' (to +/- 194') to just north of the picnic grove. The steepest part (0.5% slope) of the access drive occurs the last 200 feet, just east of the main house.

The land between the house and the garage is relatively level and is the preferred spot for parking. A meadow slopes down to the south away from the terrace. The land at the west side of the existing building drops 6 to 8 feet to a level grassy area, which was formerly a tennis court.

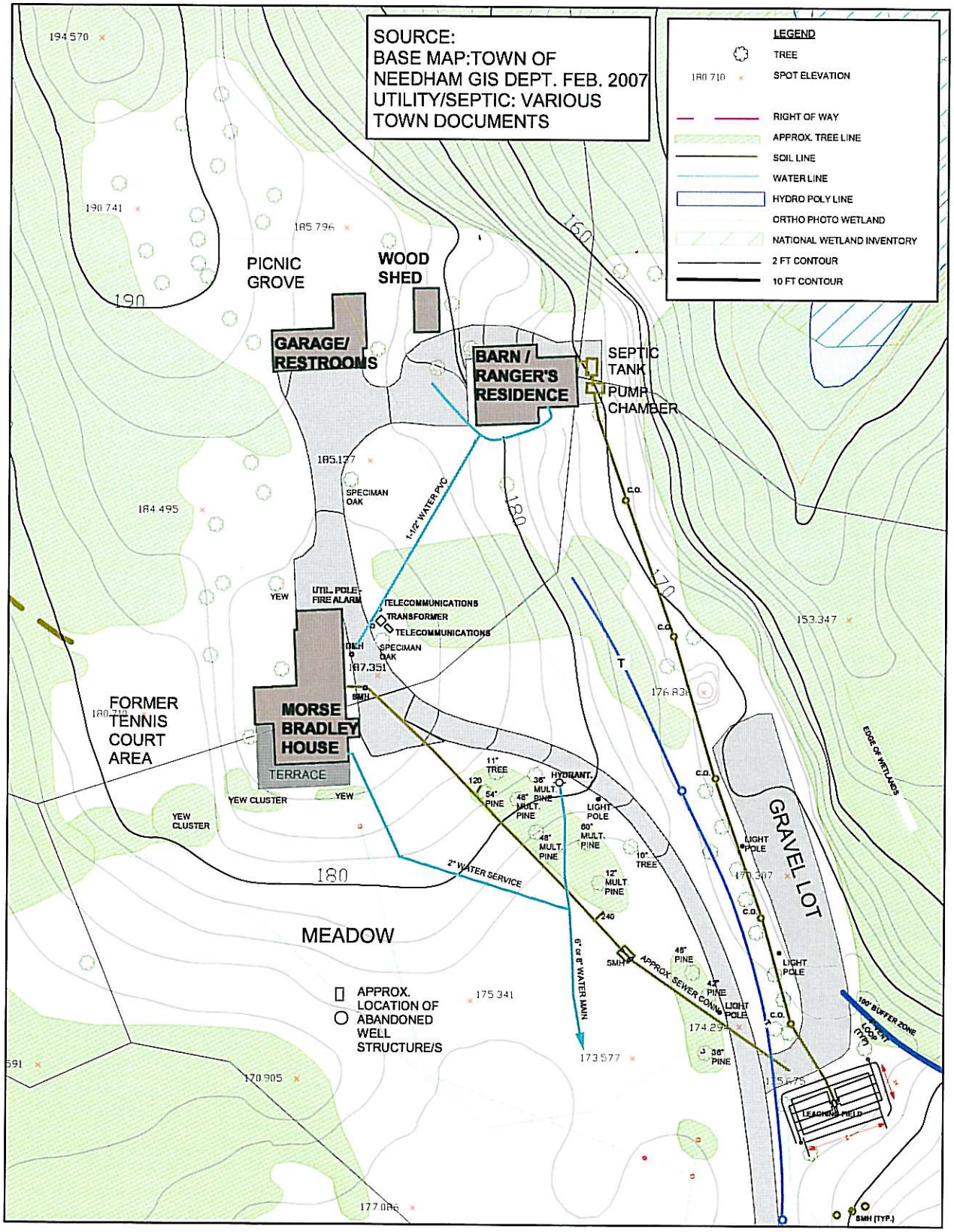
The gravel parking area lies at an elevation of about 170', approximately 16' below the area around the house.

Figure 3.3 Steepest and last 200 feet of access drive.

Figure 3.4 Access drive just before turnoff to gravel lot.

Figure 3.5 Entry to Reservation at Charles River Street. Note limited width of drive and space between stone pillars.

Figure 3.6 Relatively level area between buildings. Garage at right. House beyond.



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Ridge Hill Reservation Existing Site Plan

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Figure 3.7 RidgeHill Reservation Existing Site Plan

Access to Site

Vehicular

The entrance to the site from Charles River Street is marked by low curved stone walls on each side of the drive - approximately 24 feet apart at the narrowest point.

The existing access drive is approximately 17.5 feet wide and should be widened to a minimum of 24 feet for safe two-way vehicular circulation. The road should be widened more to the east of the drive (up to utility structures) than to the west to avoid damage to the existing trees along the western edge.

Exiting the site, the sight lines to the east are about 260 feet and to the west just shy of 300 feet. Furthermore, to the east, the sight lines are partially blocked by the existing mail box and utility pole. Given the speed of traffic coming around the curves from both the east and west, there are some safety concerns. Generally, as one ages, physical and mental reaction times increase and depth perception decreases. Also, older drivers tend to use the distance of the approaching vehicle, rather than the speed of the approaching vehicle to judge time available for maneuvering into traffic.

It is recommended that the entrance be enlarged (relocate stone walls) and include, perhaps, a turning lane from Charles River Street. More visible signage and lighting should be provided.

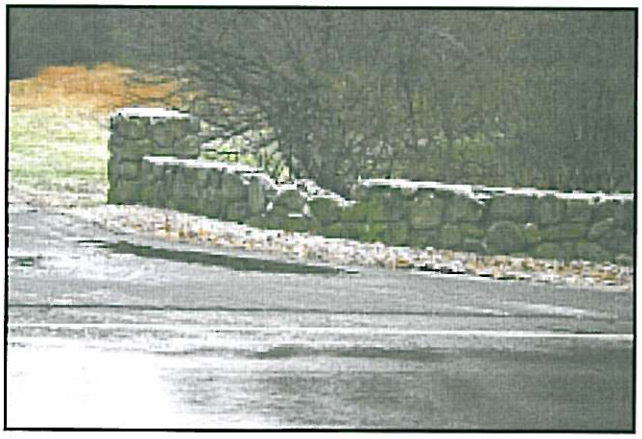


Figure 3.8 Close up of east side of stone wall that flanks the entry access drive. Note damage to section of wall.

Pedestrian Access

There are no sidewalks along Charles River Street. The only pedestrians would be those hiking the Reservation trails and would largely start their walks from the site.

A series of hiking, horseback riding, and cross country ski trails are located on the site, with one trail crossing Charles River Street and extending south to the Charles River.

Bicycle Access

Given the limited amount of residential development and the narrowness and curviness of the streets, it is unlikely there will be much bicycle traffic to this building in the foreseeable future.

Figure 3.9 Charles River Street facing east. Note curve in road limiting sight lines.

Figure 3.10 Charles River Street facing west. Access drive to right.

Site Utilities

Septic / Sewer

The existing buildings on Ridge Hill are not connected to Town sewer; they are served by three separate localized ground waste systems. Town sewer is available in Charles River Street at Whitman Road and in the development of Pheasant Landing Road.

Main House

- In 1992-3 the existing cesspool, which was linked to a group of seepage pits, was converted into a septic tank. This tank is located southwest of the pine grove on the upper meadow adjacent to the main house.
- It was reported that there are 6 seepage pits at the top of the lower meadow *(visually only three can be located).*
- The design capacity of existing system is unknown.
- The septic tank was reported to have been loaded with grease the last time the system overflowed.
- This system would require upgrading to handle the increased use of the building.

Barn / Ranger's House

- The septic system for this building is only a couple of years old. It was installed when the building became the house for the Ranger.
- It has a septic tank with a pump to the south of the building with a run to the leaching field at the top of the lower meadow, just below the gravel drive / parking area and adjacent to the main house's seepage pits.
- It was determined during the percolation testing that the soils in this area provide appropriate drainage. (See Appendix B.)

Garage / Bathrooms

- There is a cesspool behind the building (north of the ell extension).

Septic / Sewer Options

- Septic — Limited compliance (for phase I) – Town feels that if Septic is the direction, do as little as possible (for project budget reasons), until such a time that a connection to the Town sewer can be achieved. (Design capacity would be 10 gal/person/day based on a club house designation in Title 5.)
- Septic – Full compliance (assume inclusion of future building expansion)
- Connect to Town sewer – designed for large capacity.

In order to connect to the Town sewer via a gravity line (since a pump station would add considerable cost and maintenance concerns), alternate routes need to be explored taking into consideration the environmental impact on the site.

Top Left: Figure 3.11 Sewer manhole in front of main house.
Top Right: Figure 3.12 Drainage manhole in ramp to kitchen.

Left: Figure 3.13 Sewer manholes located south of leaching field.

Figure 3.14 Leaching field for Ranger's House waste.

Water

- 16" water main in Charles River Street.
- Existing documentation indicate an 6" main water line west of the access road leading to the hydrant. (Some documentation indicate an 8" line -- this should be field verified.)
- the 6" line (on site) was connected to the 16" line in 1986.
- A 2" PVC domestic water line branches off the 6" line to supply the main house and a single 1-1/2" PVC line to the Ranger's House and Garage. A new domestic water supply line should be provided to the main house.
- The closest hydrant to building is about 140 linear feet down the access drive. The static pressure is reported to be at around 76 psi at the hydrant. A hydrant flow test should be performed on this hydrant to confirm whether the water pressure is adequate. Should the pressure be inadequate, a fire pump could be added.
- A new fire suppression supply line will be required to the building. A 6" line can continue from the hydrant to the house.
- A new 4" domestic water supply line also needs to be provided into the building. It should tie into the 6" water line 10 feet from the building. *(Note: Permission must be requested from the local fire department / DPW to tap off the fire line instead of running a new domestic water line from the street, +/-1800 linear feet at a potential cost of $100,000. This additional cost would be a financial hardship to the overall project.)*

Gas

The existing commercial range is fueled with propane. Gas is available in Charles River Street – approximately 1,860 linear feet from the house.

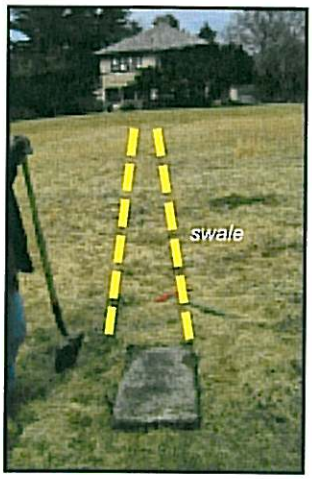
Company: NSTAR
Contact: Scott Johnson
Tel.: 781-441-8750

High pressure gas lines run along the easement to west of site. (Algonquin Gas & Transmission Line)

Design options:

- Run new gas line to street.
- Heat with propane.
- Explore geothermal opportunities.
- Commercial cooking equipment could continue to use propane.

Figure 3.15 Hydrant approximately 140 feet from House.



Figures 3.16 & 17Abandoned well structures. Swale in meadow indicates location of former supply line.

Electrical

The site is currently supplied by a 25kVA 13.8 kV-120 / 240V single-phase padmount transformer (PMH8212, tm#704458, 13.8kV circuit 456-H5, phase 1). The total kW use at the 25kVA transformer was reported to be 17kW in July 2006 and 13kW in March 2007.

The load for the senior center will likely be about 300kW. The service would need to be at least 1200A/120-208V service, which would require a transformer upgrade and change to 3-phase.

The lines leading to and from the transformer - located across the drive from the main building - are under ground. The location of the transfomer is likely to change due to the future layout of the site. The existing underground electrical supply from the street – installed in 1987 — runs along the east side of the access drive, 5' off of the pavement. A new electrical duct bank from the street to the transformer will be needed to upgrade on-site power. 3-phase primary overhead service is available at Charles River Street.

Four light poles are located within the site; two along the drive between the gravel lot and house and two at the gravel parking area. Additional lighting will be needed for the increased traffic and older drivers, and needs to be provided at the drive entrance, along length of access drive, and in all parking areas serving the building.

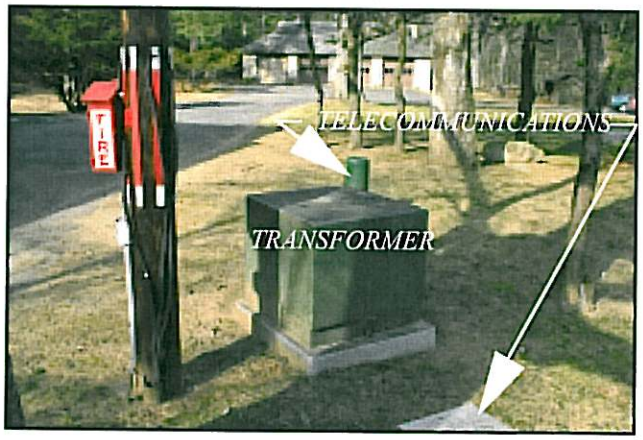


Figure 3.18 Transformer, telecommunications, and firebox located opposite drive from House.

Company: NSTAR
Contact: Kathy White
Tel.: 781-441-8311

Telephone / Telecommunications / Data

RCN added fiber optic lines in the 1990's – underground along east side of drive near the electrical conduit.

Conservation Commission

The Conservation Commission's mission is to protect the natural areas of Ridge Hill which include the meadows and forested areas in addition to select plantings. During the project, priorities were established for what should be protected.

High priority

- Contiguous tree canopy and undisturbed woodland
- Meadows
- Stand of pines along drive

Lower priority

- Speciman oaks
- Picnic grove and garage

Additionally, the Commission is concerned with the potential impacts of the proposed sewer extension on would have on the wetlands, woodlands and meadows. Flagging of the wetland boundaries will provide an accurate delineation of these resources.

Figure 3.19 Stand of pines along drive.

Figure 3.20 Speciman oak.

The resulting development will need to reconcile environmental factors while fulfilling programming needs.

Left: Figure 3.21 Picnic grove looking north.

Below: Figure 3.22 Tree canopy to west.

Bottom: Figure 3.23 View north to house across meadow.

Other Uses on Site

Besides public functions at the main house and the public's use of the walking trails, the site accommodates town equipment storage and a summer camp. The garage is used to store Town equipment (snow plows / mowers) and provides a staging area for the summer camp that the Recreation Department runs. The garage has restrooms primarily for this programming. The picnic grove with picnic tables is home base. Operational and physical considerations will need to be made in the future to ensure the safety of campers and elders using the site, particularly in the parking area.

Zoning Analysis

#463 Charles River Street
Zoning District: Single Residence A
Size: +/- 222 acres

Permitted Uses

Public, Semi-public and Institutional: municipal structure. (3.2.1)

Dimensional Regulations (4.2)

	Proscribed	+/-Exist.	+/-Proposed
Min. Lot Area (Acre)	1	222	no change
Min. Lot Frontage LF	150	1,690	no change
Max. Floor Area Ratio	0.30	0.0009	0.003
Max. % Lot Coverage	15%	0.7%	1.4%
Max.Bldg.Height*			
Stories	2-1/2 / 3*	2	2
Feet	35 / 40*	38	40**
Setbacks			
Front (feet)	35	>35	>35
Side (feet)	25	>25	>25
Rear (feet)	25	>25	>25

*4.2.2 Height Limitation Exceptions: The maximum height regulation in Section 4.2.1 shall not apply to ...municipal buildings which may contain three stories or may be as high as forty (40) feet.

**Note: The roof of the addition is lower than the existing roof. The reason the height appears to increase is that the grade around the addition drops (exposing a portion of the basement) and changes the average grade reference point.

Definitions

Height: the vertical distance of the highest point of a structure or the roof of a building above the average grade of the ground adjoining the building or surrounding the structure.

Basement: that portion of a building which is partly below grade and having at least one half of its height below finished grade.

Floor Area Ratio: the gross floor area (total) divided by the lot area

Parking

Number of spaces (5.1.2 - 1)

Place of Public Assembly:

1 space per 3 occupants (capacity based on 780 CMR)

Dimensions / Configuration (minimum)

Typical: 9' x 18.5' (including 1 foot of bumper overhang)

Parallel Space: 9' x 22' (minimum length)

Compact Cars (up to 50% of total parking)

8' x 16' (including 1 foot of bumper overhang)

**HC Parking (5.1.3-b)*

Shall be in accordance with 521 CMR Architectural Access Board regulations.

Size: 8' space / 5' striped aisle, an aisle may be shared between two accessible spaces or 12' wide space

Number of HC spaces

Total Pkg Spaces	Required HC Spaces*
26 – 50	2
51 – 75	3
76 – 100	4
101 - 150	5
151 - 200	6
201 – 300	7
301 – 400	8

* Note: Architect recommends providing more HC spaces than required due to the larger percentage of mobility impaired persons in the senior population.

Van accessible spaces

8' wide plus 8' aisle access

Width of Maneuvering Aisle (5.1.3-i)
90 degree parking - minimum width of aisle to be 24 feet (25 feet where one foot of bumper overhang into aisle occurs).
Parallel – 12' minimum aisle width

Off-Street Loading requirements (5.1.3-b)
Adequate off-street loading facilities and space with unimpeded access shall be provided for … all building additions greater than 100 square feet and shall be so sized and arranged that no trucks shall be parked on a public way while loading, unloading or waiting to do so.

Landscaped Areas (5.1.3-k)
Planting beds shall be at least 4 feet wide. In any parking area requiring more than ten spaces, ten (10) percent or more of such area shall be maintained as landscaped area. In parking areas requiring 20 or more spaces, a minimum of one-quarter of this amount shall be located in the interior of the parking area.

Trees (5.1.3-l)
One tree shall be provided for every 10 spaces or fraction thereof. (e.g.100 spaces – 10 trees.) Such trees shall be located within or around the parking area so as to screen and soften the visual impact of parked vehicles as much as possible. They shall be at least 2" trunk diameter, with not less than 40 square feet of unpaved soil or other permeable surface are per tree. Planting beds shall be at least 4 feet wide.

Bicycle Racks (5.1.3-n)
For every parking area of forty or more spaces, bicycle racks facilitating locking shall be provided to accommodate one bicycle per twenty parking spaces. (E.g.100 spaces - 5 bicycles.)

Access (5.3.1)
Site arrangement and driveway layout shall provide sufficient access for emergency and service vehicles, including fire, police, and rubbish removal.

Drainage (5.3.2)
Storm-water and snow melt drainage shall be provided for without causing surface flows across any public sidewalk and without creating more than a 10% increase in peak flows in any off-site drainage structures or water courses in a 25-year storm unless provisions have been made to accommodate that increase without public expense.

Environment (5.3.6)
Site arrangements and grading shall minimize the number of removed trees 8" trunk diameter or larger, the volume of earth cut and fill, and the area of wetlands vegetation affected.

Site Plan Review / Design Review
Site plan review and a special permit will be required for this project, which falls under the definition "Major Project." A major project is any project that involves: the construction of 10,000 or more square feet gross floor area; or an increase in gross floor area by 5,000 or more square feet; or any project which results in the creation of 25 or more new off-street parking spaces. The Planning Board is the granting authority. The Design Review Board and other Town department / agencies will also review the project and provide recommendations.

Figure 3.24 Lower gravel parking area currently accommodates about 17 cars.